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REMARKS

Claims 1-20 are pending in this application.

Applicant gratefully acknowledges the Office Action's indication of allowable subject matter in claims 4-7 and 13-16. However, for the reasons set forth below, Applicant respectfully asserts that all of the claims are directed to allowable subject matter and that the application is in condition for allowance.

The Office Action rejects, under 35 U.S.C. § 103, claims 1-3, 8, 9, 11, 12, and 17-20 over Bourmeyster et al. (U.S. Patent No. 5,680,393) and Yoshida et al. (U.S. Patent No. 5,617,472) and claim 10 over Bourmeyster, Yoshida, and Liu et al. (U.S. Patent No. 6,108,412). These rejections are respectfully traversed.

Applicant asserts that Bourmeyster and Yoshida do not disclose or suggest adaptively determining an order of noise suppression and echo cancellation based on the background noise in a signal received at an input to a communication device, as recited in independent claim 1.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references, when combined, must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure (MPEP 2142). The prior art must suggest the desirability of the claimed invention (MPEP 2143.01).

Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

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Bourmeyster does not disclose an order of noise suppression and echo cancellation is adaptively determined based on background noise in a signal received at an input to a communication device. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments. There is no disclosure of adaptively determining which of the two embodiments is used or even any benefits of the first embodiment over the second embodiment. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first embodiment. This does not disclose the adaptive determination of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not determine an order based on a signal received at an input to a communication device. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure of determining which embodiment to use based on a signal received at an input to a communication device. In summary, Bourmeyster only discloses two design possibilities but does not disclose adaptively determining which one to use based on a signal received at an input to a communication device. Furthermore, Bourmeyster does not disclose any way of switching the embodiments.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of adaptively determining an order of noise suppression and echo cancellation. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of noise suppression and echo cancellation would not be adaptively determined.

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Furthermore, the Office Action admits on page 3 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would be added or removed and the order would remain the same.

Thus, Bourmeyster and Yoshida do not disclose or suggest adaptively determining an order of noise suppression and echo cancellation based on the background noise in a signal received at an input to a communication device, as recited in independent claim 1.

Applicant also asserts that Bourmeyster and Yoshida do not disclose or suggest an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal, as recited in independent claim 9.

As discussed above, Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

Bourmeyster does not disclose an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments. There is no disclosure of adaptively determining which of the two embodiments is used or even any benefits of the first embodiment over the second embodiment. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first

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embodiment. This does not disclose the adaptive determination of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not determine an order based on a signal received at an input to a communication device. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure of determining which embodiment to use based on an amount of noise in a received signal. In summary, Bourmeyster only discloses two design possibilities but does not disclose adaptively determining which one to use based on a signal received at an input to a communication device.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an <u>order</u> of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of noise suppression and echo cancellation would not be adaptively determined. Furthermore, there is no disclosure in either of the references of how the first embodiment could be adaptively manipulated to result in the second embodiment within the same device.

Additionally, the Office Action admits on page 3 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would only be added or removed and the order would remain the same.

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Thus, Bourmeyster and Yoshida do not disclose or suggest an electronic device including an adaptive echo and noise control system that is configured to adaptively determine an order of echo cancellation and noise suppression based on an amount of noise in a received signal to generate a desired signal, as recited in independent claim 9.

Applicant further asserts that Bourmeyster and Yoshida do not disclose or suggest configuring an order of echo cancellation and noise suppression to perform echo cancellation prior to noise suppression on an acoustic signal if a noise component is below at least one threshold to obtain a desired signal and configuring the order of echo cancellation and noise suppression to perform noise suppression prior to echo cancellation on the acoustic signal if the noise component is above the at least one threshold to obtain a desired signal, as recited in independent claim 19.

As discussed above, Bourmeyster discloses a method and device for suppressing background noise in a voice signal and corresponding system with echo cancellation (col. 1, lines 1-11). Bourmeyster discloses two embodiments of a combined background noise suppression and echo cancellation system. A first embodiment is included in a terminal and includes a background noise suppression device 1 and an echo canceller 3 (Fig. 3 and col. 6, lines 59-66). A second embodiment of a combined noise suppression and echo cancellation system includes an echo canceller 3, a frequency-domain processing unit 100, and a time-domain processing circuit 14.

Bourmeyster does not disclose configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. In particular, Bourmeyster expressly discloses the two embodiments as separate embodiments. There is no disclosure of configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. Bourmeyster only discloses the second embodiment avoids duplication of the circuit 14 in the branch including the circuit 31 (col. 8, lines 4-6). This only discloses the second embodiment may be preferential to the first embodiment. This does not disclose the configuration of which embodiment to use. Furthermore, this also illustrates how Bourmeyster does not configure an order based on comparing a signal to a threshold. In particular, the two embodiments are shown as two separate embodiments. There is no disclosure

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of determining which embodiment to use based on any information. In summary, Bourmeyster only discloses two design possibilities but does not disclose configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold.

Yoshida fails to make up for the deficiencies of Bourmeyster. In particular, Yoshida discloses noise suppression of an acoustic signal in a telephone set (col. 1, lines 1-2). A noise canceler cancels a noise component from a transmitting acoustic signal when a noise level is not smaller than a first threshold (col. 2, lines 8-11). This is not the disclosure of configuring an order of echo cancellation and noise suppression based on comparing a noise component to a threshold. This is only the disclosure of canceling noise based on a noise level. In particular, Yoshida only determines if noise cancellation is to be used or not. Yoshida does not determine an order of noise suppression and echo cancellation.

In fact, even if the teachings of Yoshida were combined with the teachings of Bourmeyster, such a combination would only result in two separate design possibilities or embodiments, each embodiment including a noise canceler that cancels noise based on a noise level. The order of echo cancellation and noise suppression would not be configured based on comparing a noise component to a threshold. Furthermore, there is no disclosure in either of the references of how the first embodiment could be configured to result in the second embodiment within the same device.

Additionally, the Office Action admits on page 6 the combination of the teachings of Yoshida and Bourmeyster would only result in switching between echo cancellation only and echo cancellation with noise suppression. This is only turning noise suppression on or off. It has nothing to do with adaptively determining the order of noise suppression and echo cancellation. In particular, according to the alleged combination, noise suppression would only be added or removed and the order would remain the same.

The Office Action goes on to allege "because the combination performs echo cancellation by itself when the noise level is below the threshold and noise suppression when the noise level is above the threshold, the combination performs echo cancellation prior to noise suppression when the noise level is below a threshold." Not only is this statement completely illogical, this statement is also not supported by the references. In particular, there is no teaching in either

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reference that performing echo cancellation by itself results in performing echo cancellation prior to noise suppression. More particularly, the concept of performing of echo cancellation <u>by itself</u> eliminates the use of noise suppression. Therefore, the echo cancellation cannot be performed before noise suppression because noise suppression <u>is not performed</u>. A second action cannot be performed after a first action when the second action is never performed. By definition, if the second action is never performed, it is not performed after the first action. Thus, the Office Action's allegation is both illogical and not supported by the references. This concept holds true for the rejections of all of the claims.

Therefore, Bourmeyster and Yoshida do not disclose or suggest configuring an order of echo cancellation and noise suppression to perform echo cancellation prior to noise suppression on an acoustic signal if a noise component is below at least one threshold to obtain a desired signal and configuring the order of echo cancellation and noise suppression to perform noise suppression prior to echo cancellation on the acoustic signal if the noise component is above the at least one threshold to obtain a desired signal, as recited in independent claim 19.

Therefore, Applicant respectfully submits that independent claims 1, 9, and 19 define patentable subject matter. The remaining claims depend from the independent claims and therefore also define patentable subject matter. Accordingly, Applicant respectfully requests the withdrawal of the rejections under 35 U.S.C. § 103.

CONCLUSION

Based on the foregoing amendments and remarks, Applicant respectfully submits this application is in condition for allowance. Favorable consideration and prompt allowance of claims 1-20 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

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    The Commissioner is hereby authorized to deduct any fees arising as a result of this Amendment or any other communication from or to credit any overpayments to Deposit Account No. 50-2117.

                                          Respectfully submitted,

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